Erfolgskontrolle 01

Kurze Testfrage

```
Remove["Global`*"]
```

1

```
m1 = 300;
m2 = 400;
v1 = 4;
v2 = -3;
En = 1 / 2 (m1 v1^2 + m2 v2^2);
Pn = m1 v1  + m2 v2;
g1 = (En == 1 / 2 (m1 w1^2 + m2 w2^2));
g2 = (Pn == (m1 w1 + m2 w2));
Solve[{g1, g2}, {w1, w2}]
```

```
{{w1 → -4, w2 → 3}, {w1 → 4, w2 → -3}}
```

Lösung: {w1 -4, w2 3}

2

```
m1 = 200;
m2 = 300;
v1 = 3;
v2 = -2;
En = 1 / 2 (m1 v1^2 + m2 v2^2);
Pn = m1 v1  + m2 v2;
g1 = (En == 1 / 2 (m1 w1^2 + m2 w2^2));
g2 = (Pn == (m1 w1 + m2 w2));
Solve[{g1, g2}, {w1, w2}]
```

```
{{w1 → -3, w2 → 2}, {w1 → 3, w2 → -2}}
```

Lösung: {w1 -3, w2 2}

Variante

Wenn die Vorzeichen der gegebenen Geschwindigkeiten als gleich angenommen werden

```
Remove["Global`*"]
```

1

```
m1 = 300;
m2 = 400;
v1 = 4;
v2 = 3;
En = 1 / 2 (m1 v1^2 + m2 v2^2);
Pn = m1 v1  + m2 v2;
g1 = (En == 1 / 2 (m1 w1^2 + m2 w2^2));
g2 = (Pn == (m1 w1 + m2 w2));
solv1 = Solve[{g1, g2}, {w1, w2}]
```

$$\left\{\left\{w1 \to \frac{20}{7}, w2 \to \frac{27}{7}\right\}, \{w1 \to 4, w2 \to 3\}\right\}$$

```
solv1 // N
```

```
{{w1 → 2.85714, w2 → 3.85714}, {w1 → 4., w2 → 3.}}
```

Lösung: {w1 2.85714, w2 3.85714}

2

```
m1 = 200;
m2 = 300;
v1 = 3;
v2 = 2;
En = 1 / 2 (m1 v1^2 + m2 v2^2);
Pn = m1 v1  + m2 v2;
g1 = (En == 1 / 2 (m1 w1^2 + m2 w2^2));
g2 = (Pn == (m1 w1 + m2 w2));
solv2 = Solve[{g1, g2}, {w1, w2}]
```

$$\left\{\left\{w1 \to \frac{9}{5},\ w2 \to \frac{14}{5}\right\},\ \{w1 \to 3,\ w2 \to 2\}\right\}$$

```
solv2 // N
```

```
{{w1 → 1.8, w2 → 2.8}, {w1 → 3., w2 → 2.}}
```

Lösung: {w1 1.8, w2 2.8}